

FIG. 1A

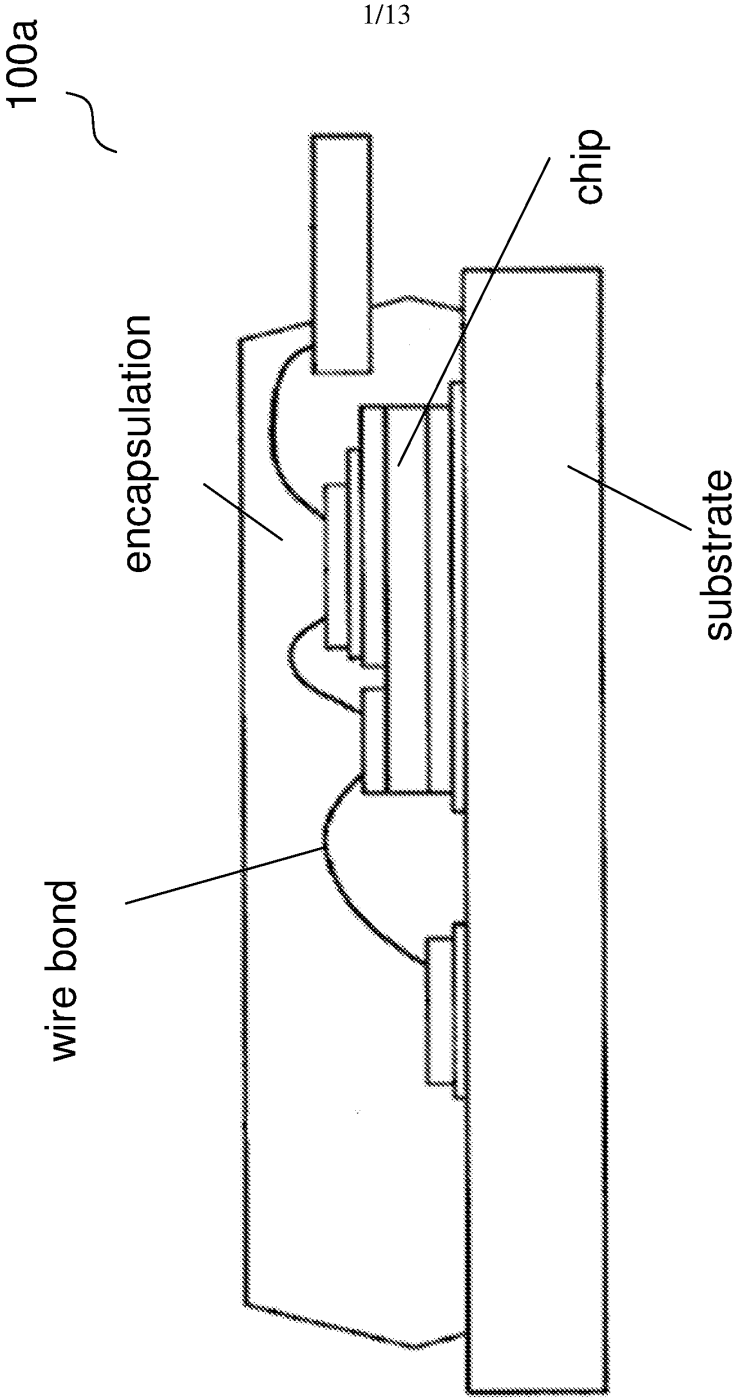
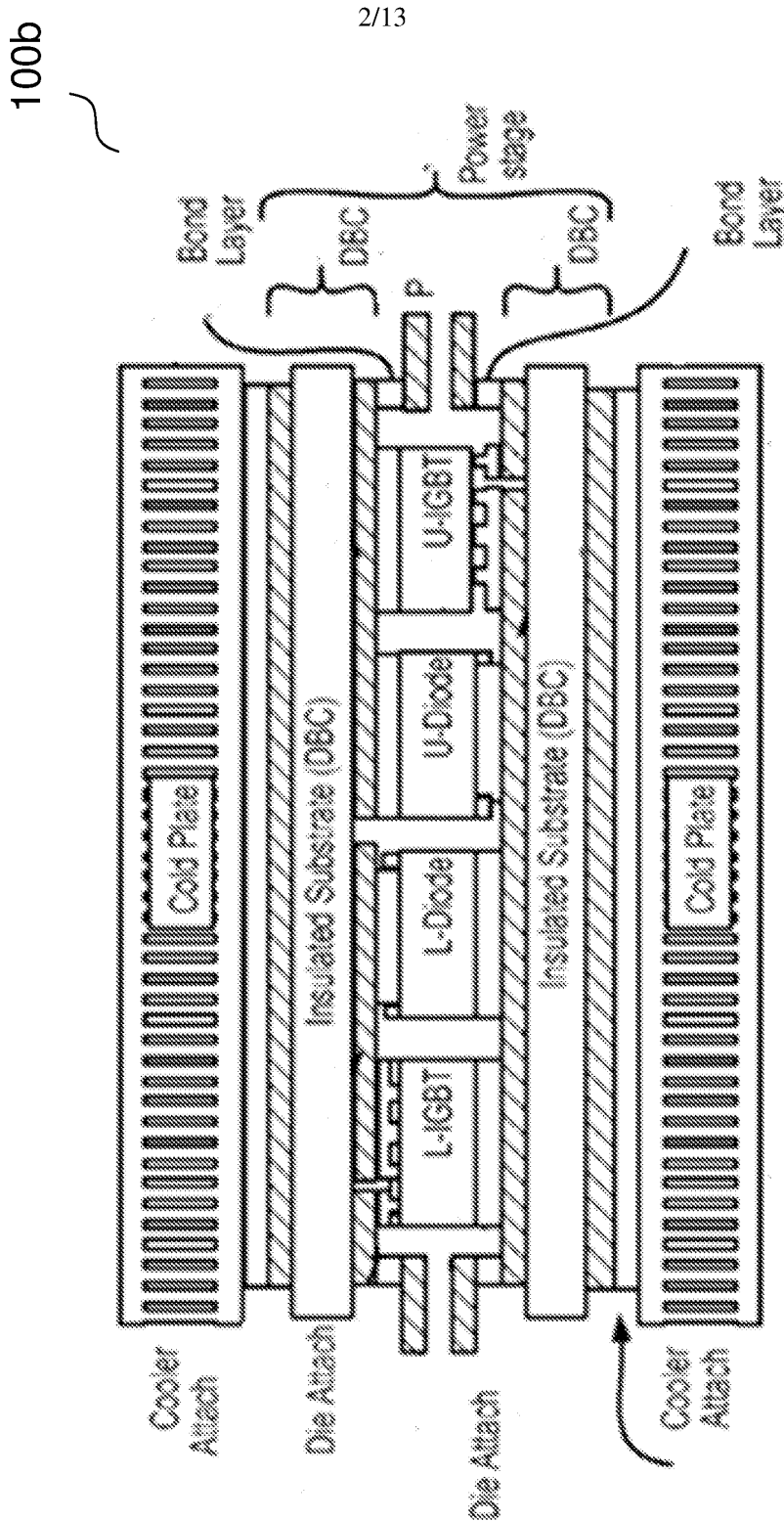
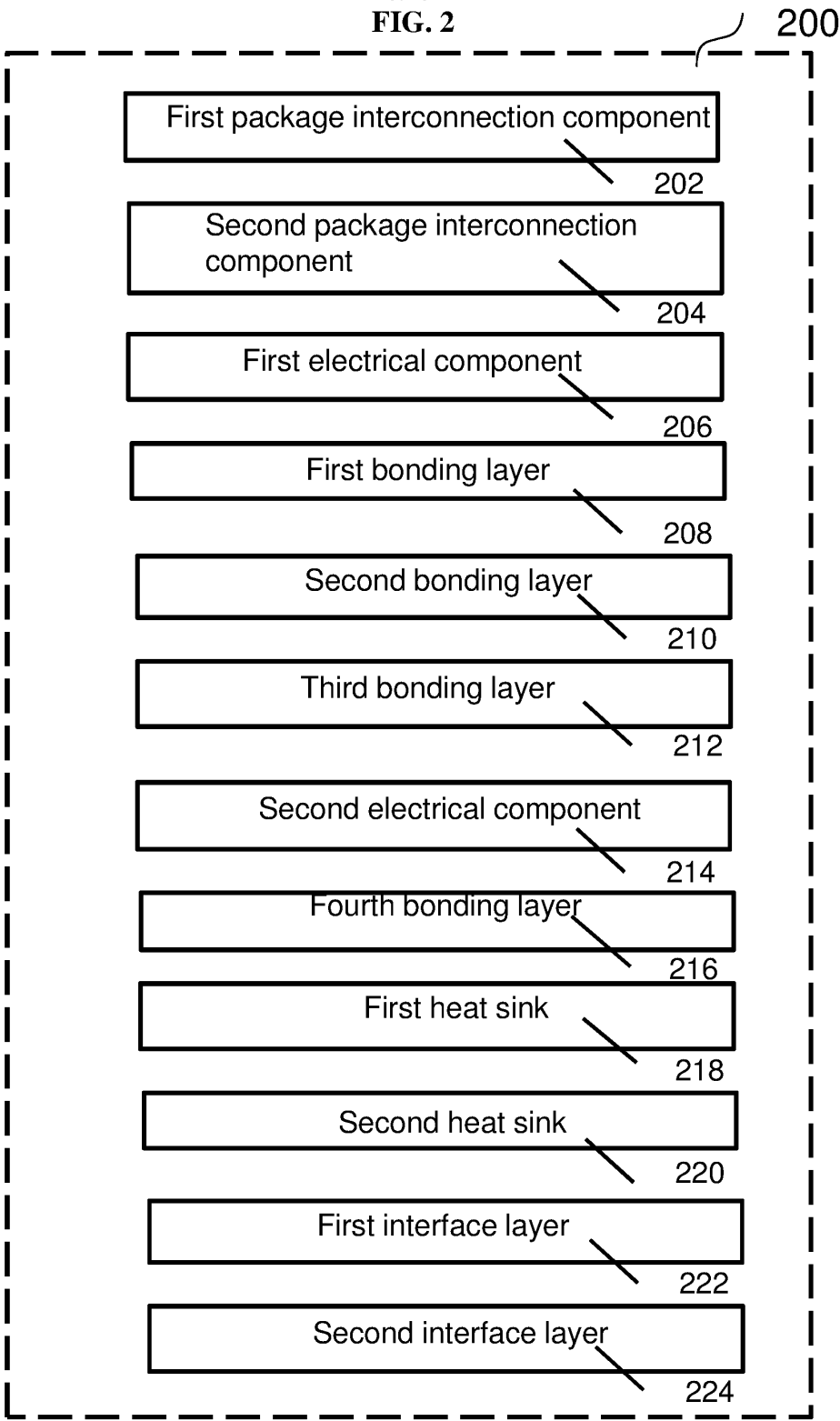


FIG. 1B



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FIG. 2



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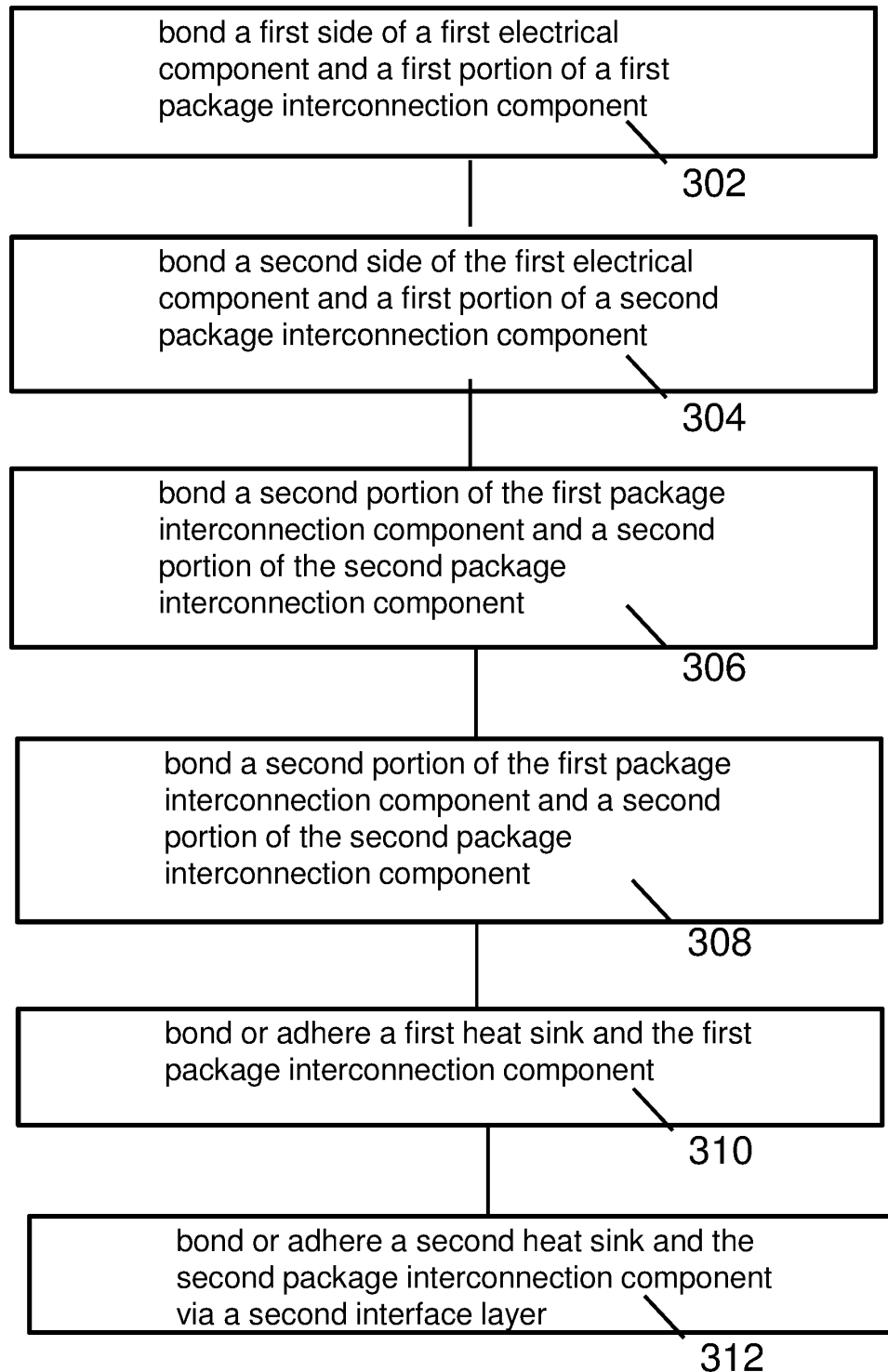
FIG. 3

FIG. 4A

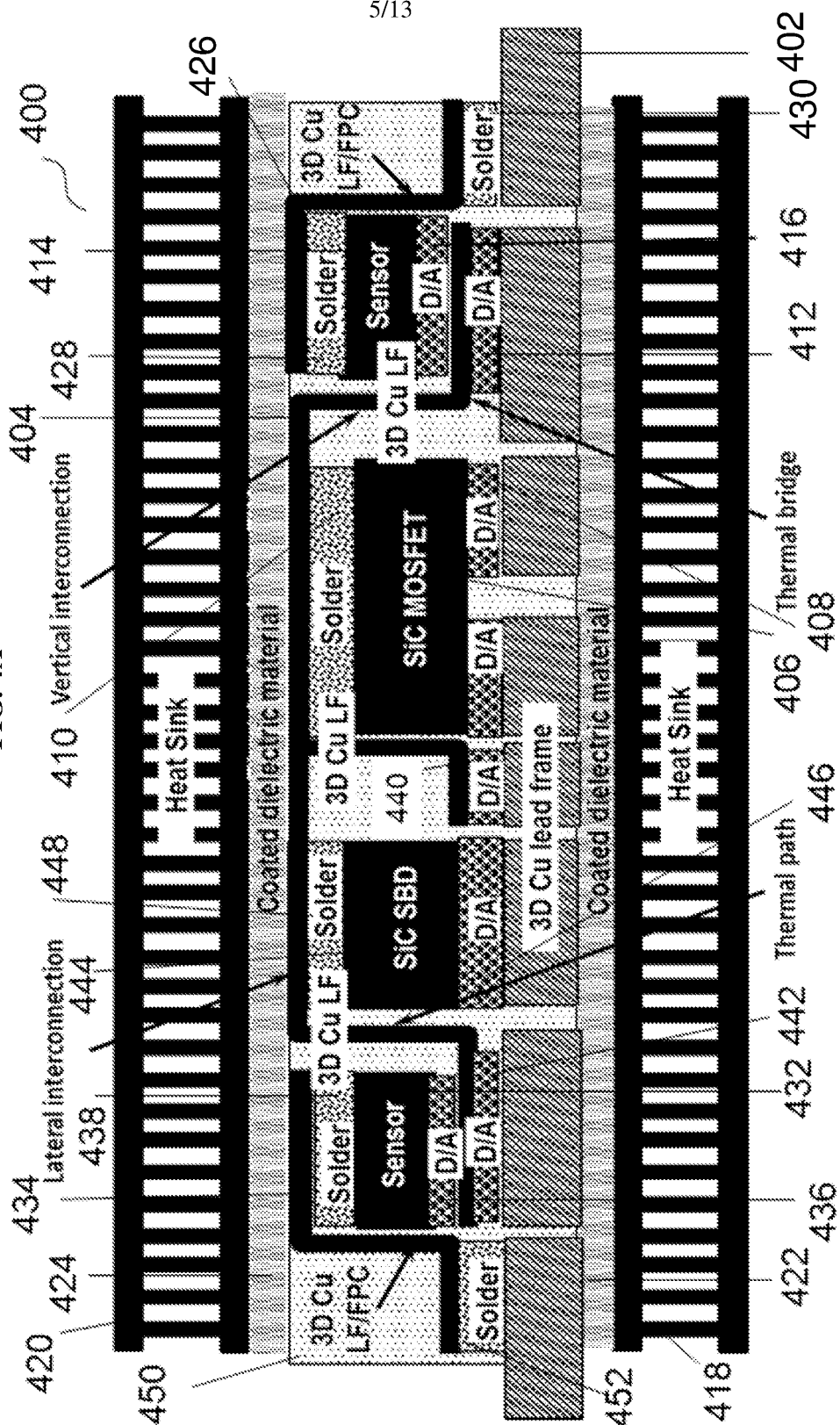


FIG. 4B

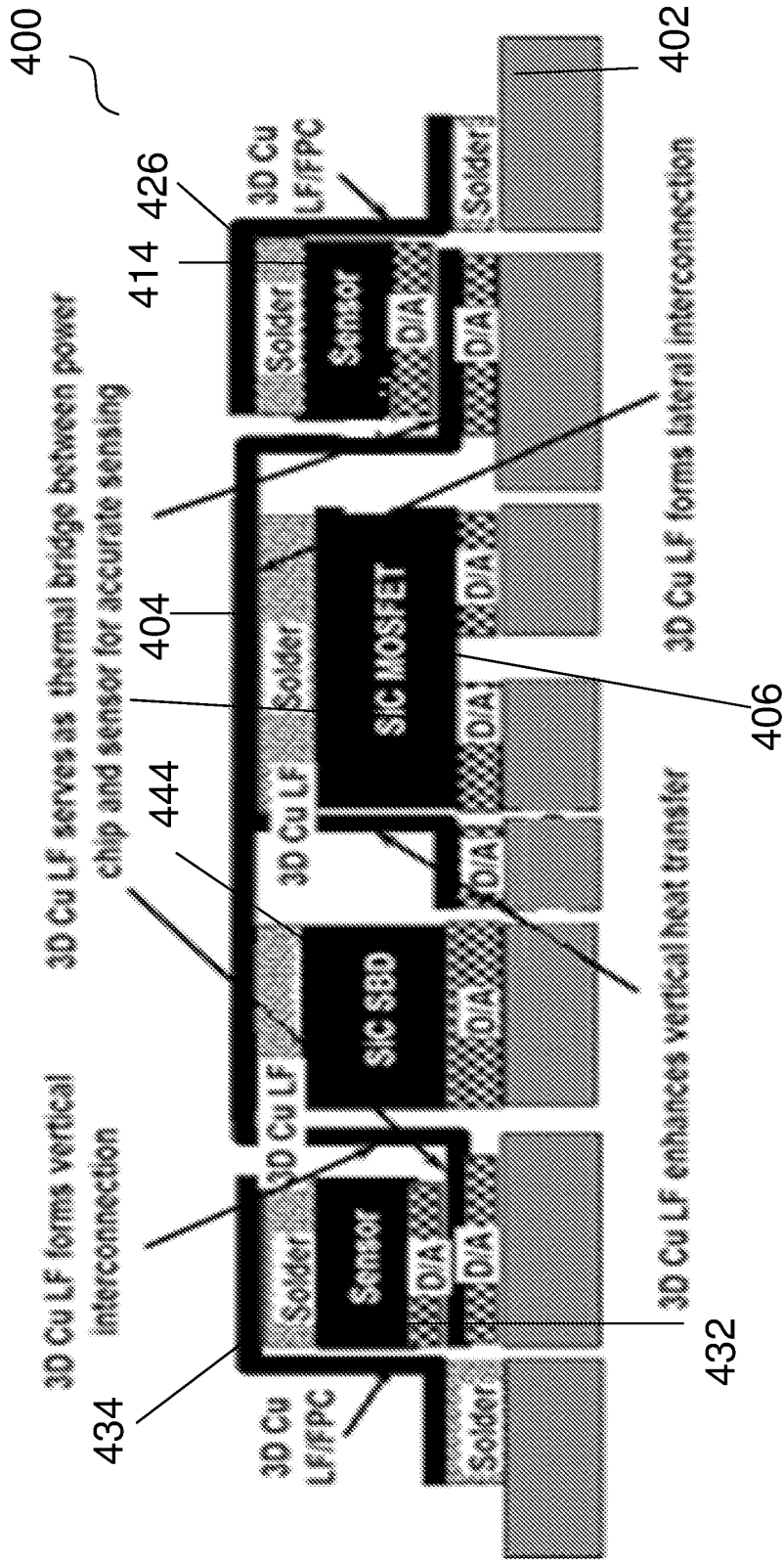
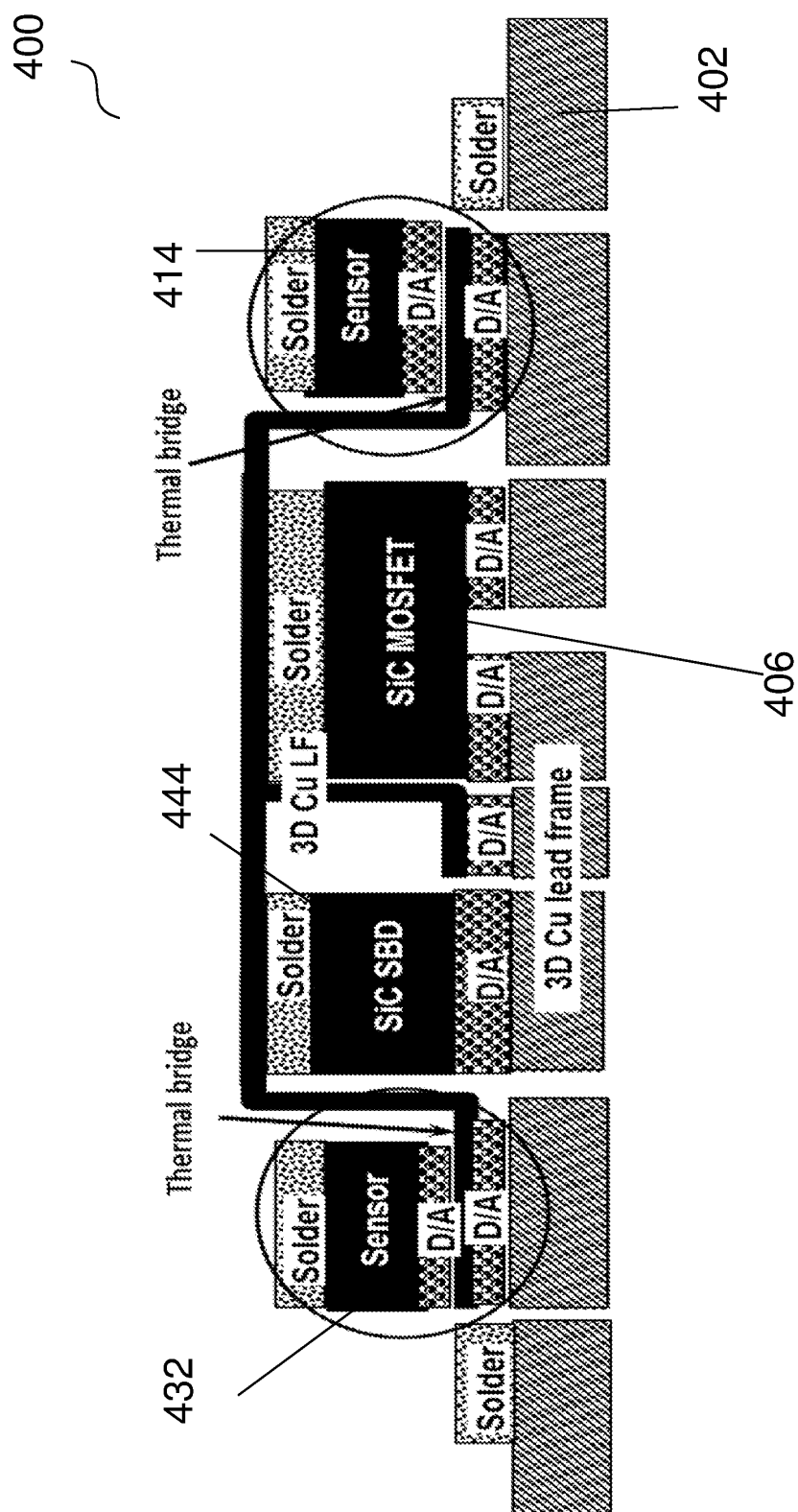
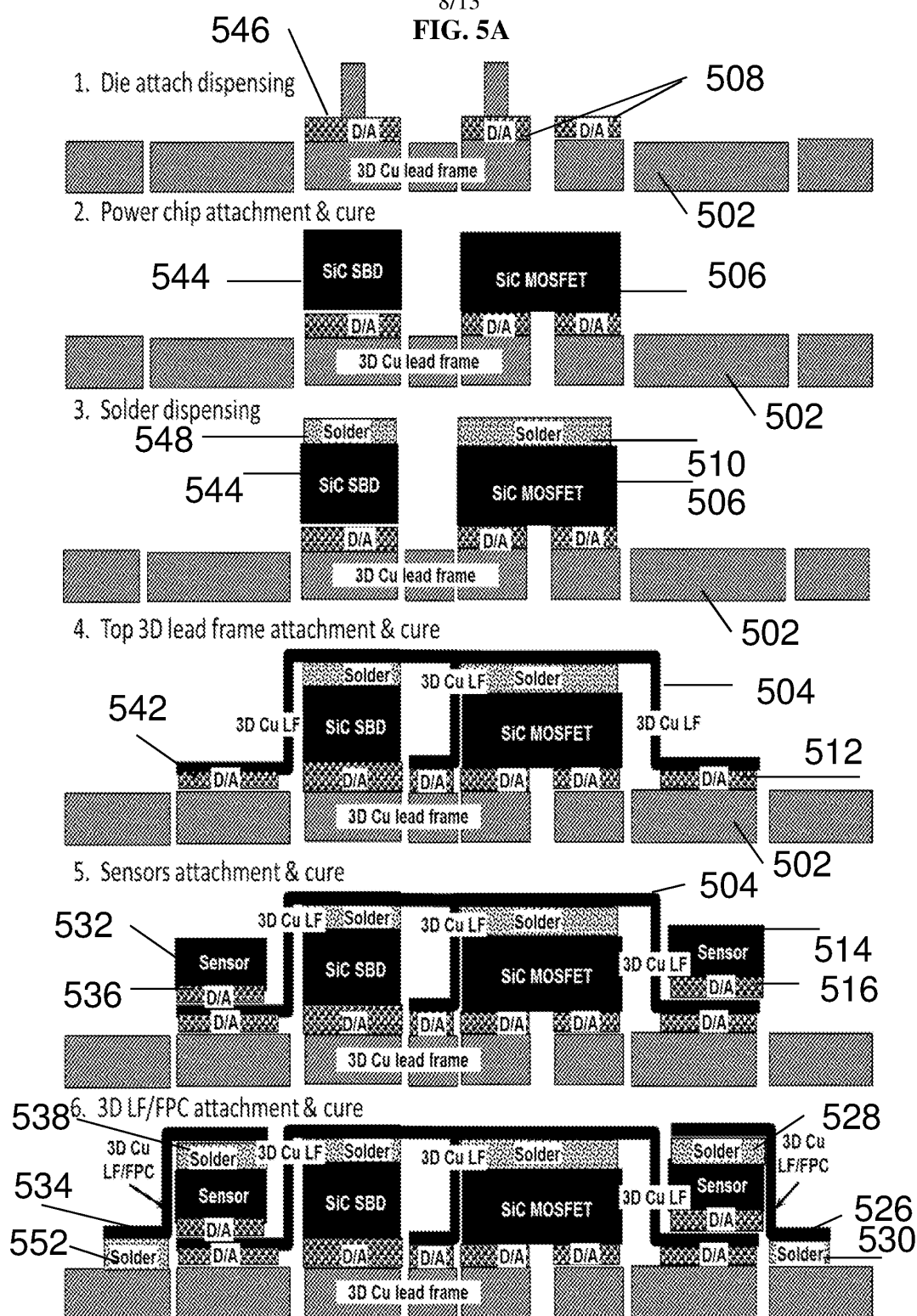


FIG. 4C



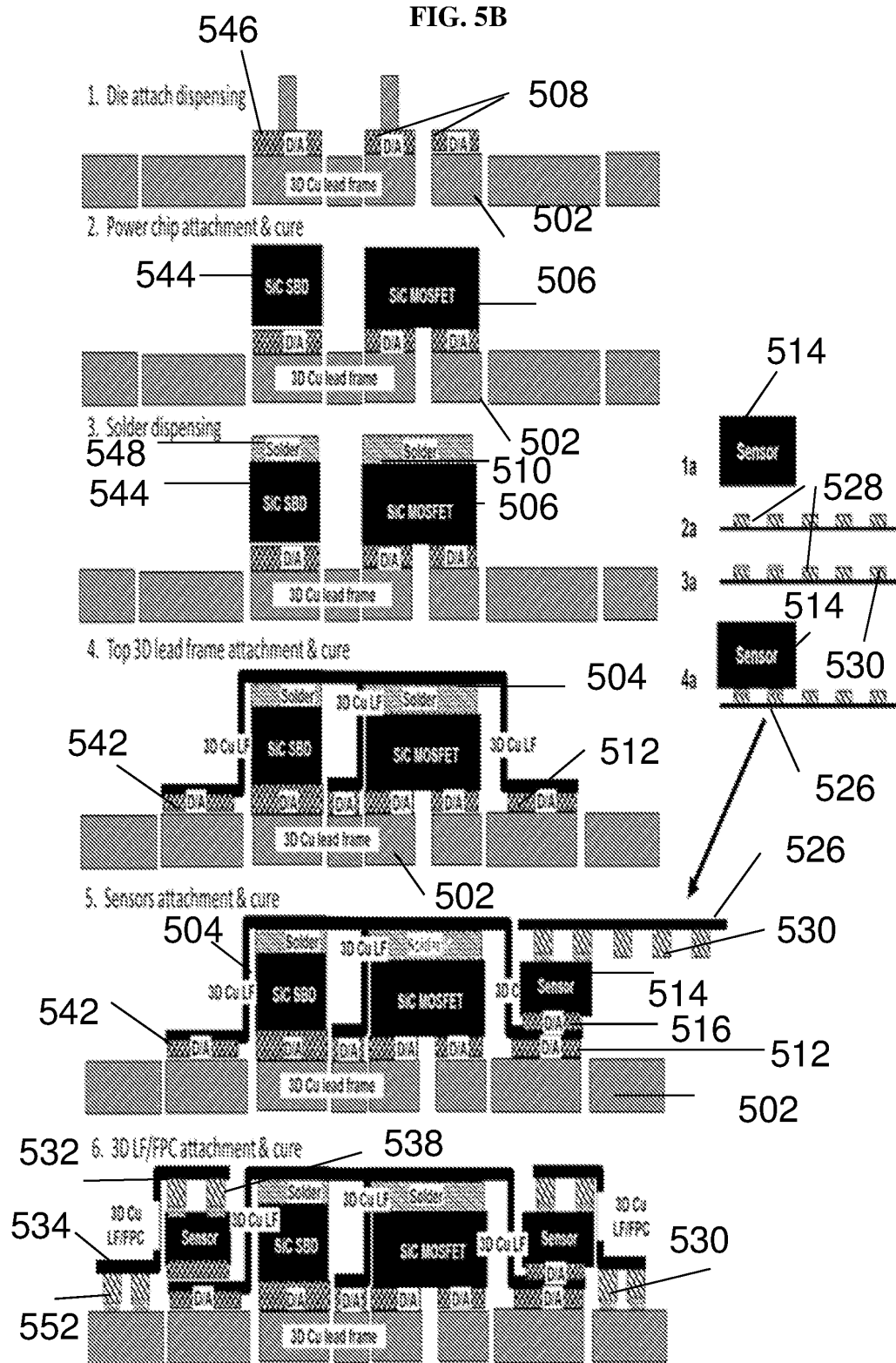
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FIG. 5A



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FIG. 5B



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FIG. 5C

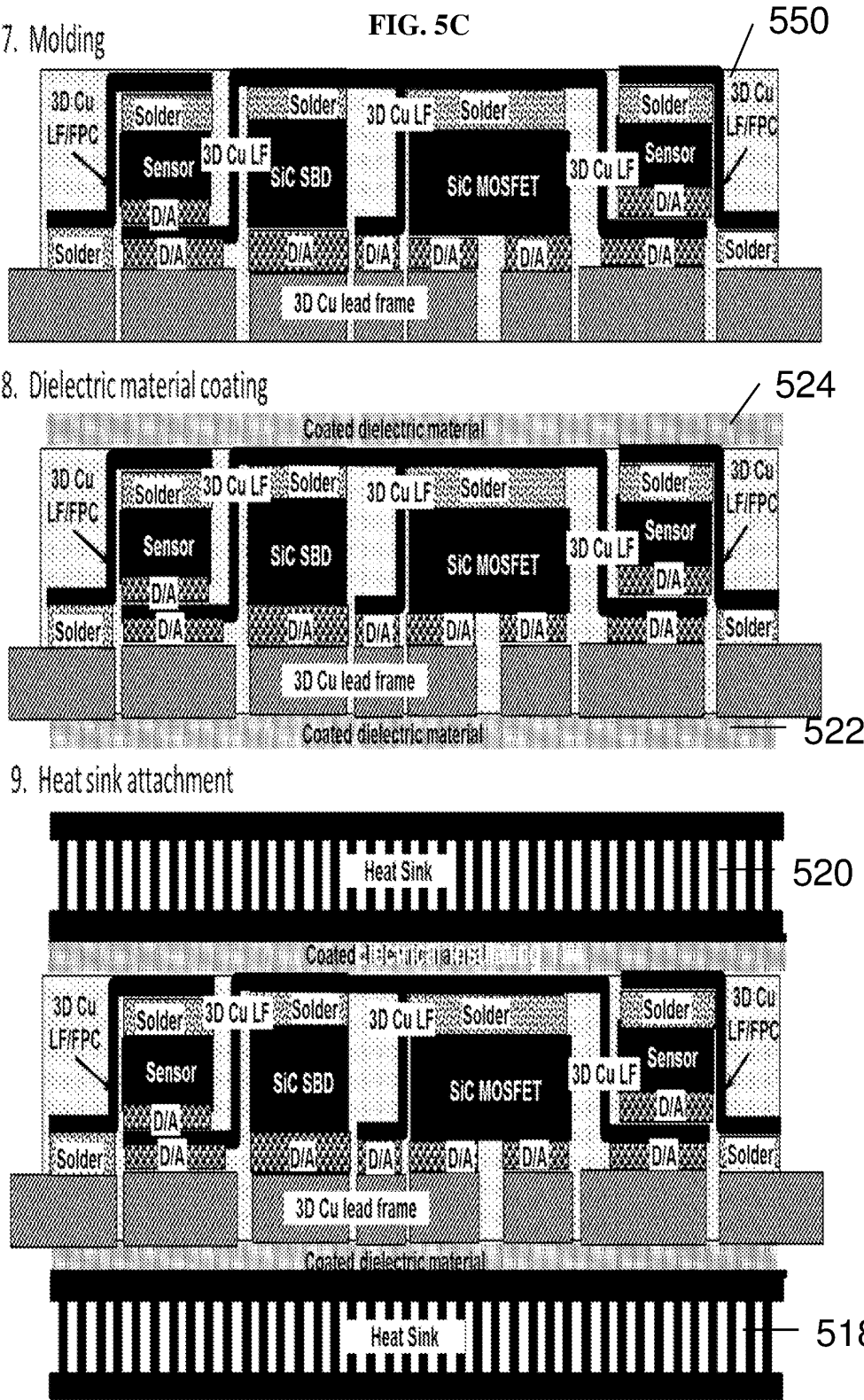


FIG. 6A

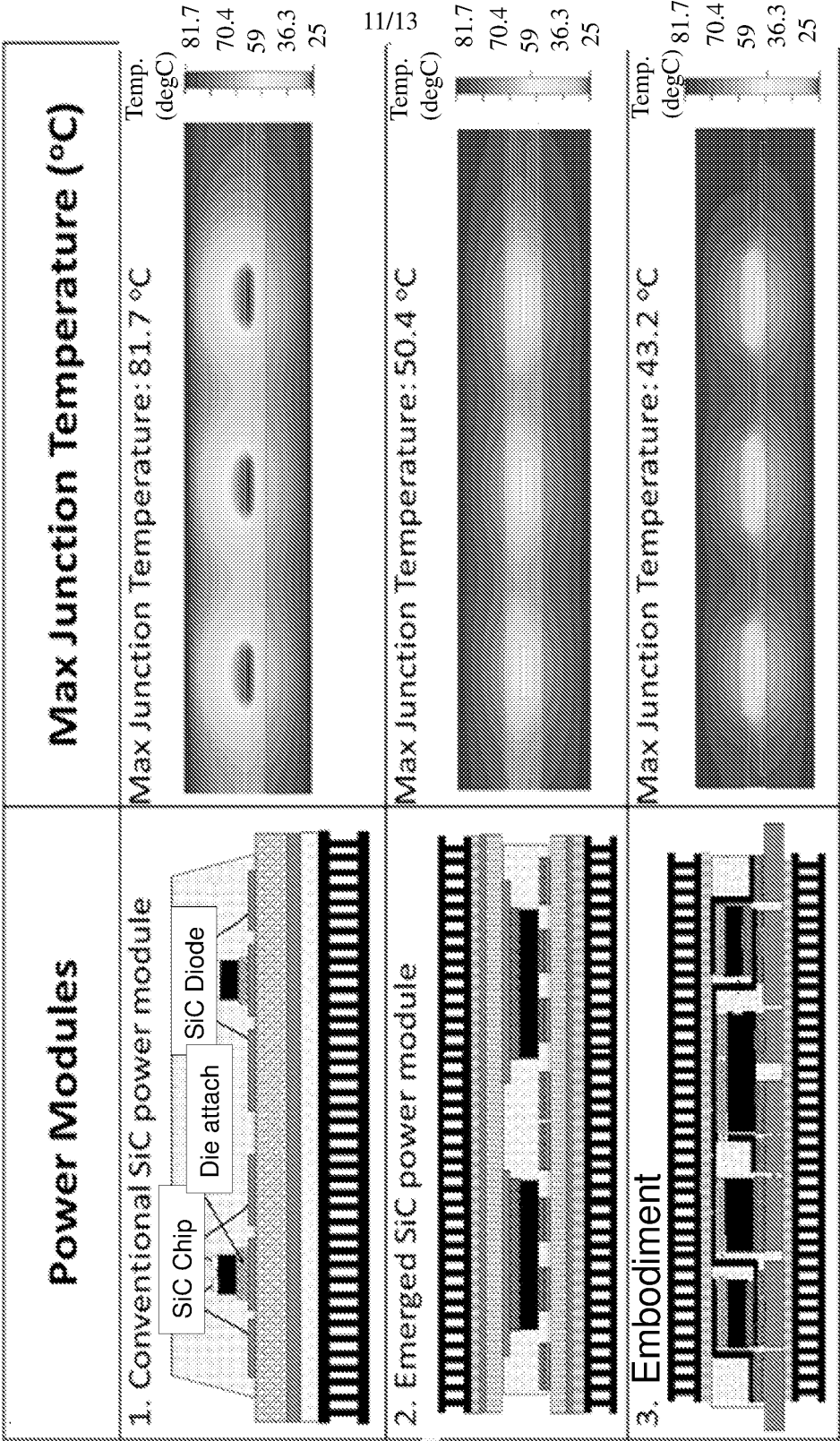


FIG. 6B

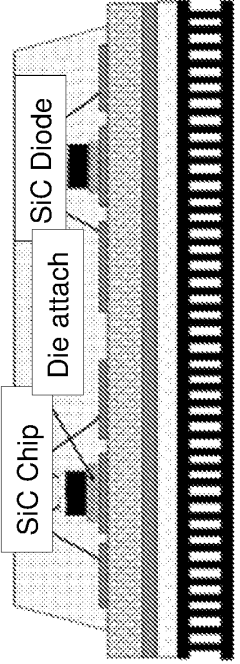
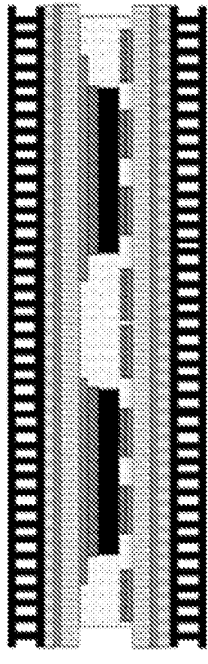
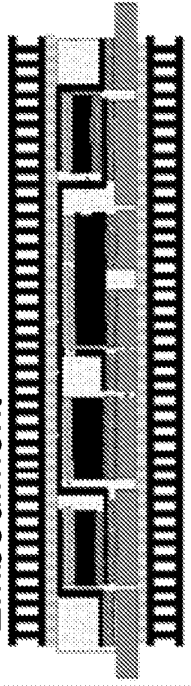
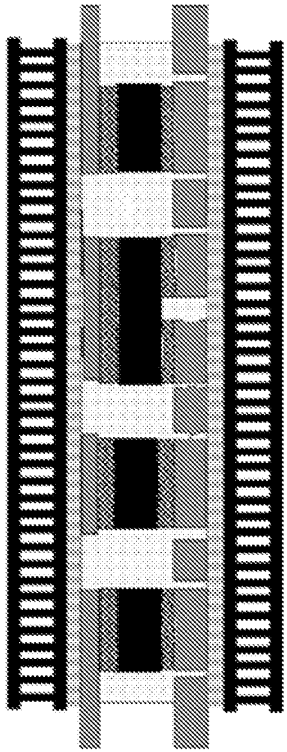
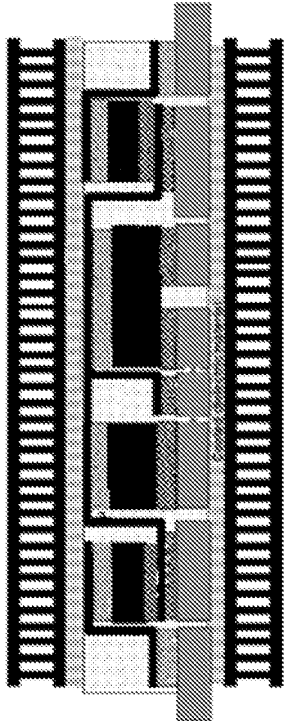
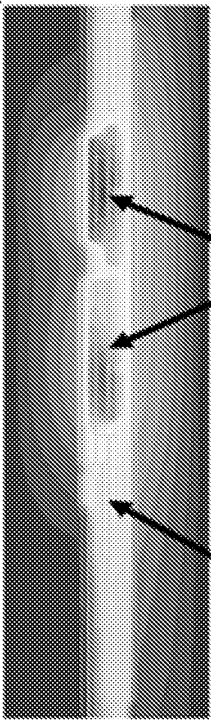
Power Modules	Junction to Case Thermal Resistance (°C/W)
1. Conventional SiC power module 	0.315
2. Emerged SiC power module 	0.141
3. Embodiment 	0.101

FIG. 6C

Alternative power chip and sensor integration	 A cross-sectional diagram showing a substrate with a central layer containing four rectangular power chips. Above and below this central layer are rows of small, rectangular sensor elements. The sensor elements are positioned directly above and below the power chips, creating a close proximity for thermal sensing.
Embodiment	 A cross-sectional diagram showing a substrate with a central layer containing four rectangular power chips. Above and below this central layer are rows of small, rectangular sensor elements. The sensor elements are positioned directly above and below the power chips, creating a close proximity for thermal sensing.  A micrograph showing a top-down view of the embodiment. It displays a row of four rectangular power chips. Above the first chip, a small, rectangular sensor element is visible. Arrows point from the labels 'Sensor' and 'Power chips' to their respective components. Temperature difference between sensor and power chip: 10 °C